

Applicants: Novak et al.

Serial No.: 10/787,442

Filed: February 26, 2004

For: CYTOKINE ZALPHA11 LIGAND FUSION PROTEINS

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**Amendments to the Claims:**

Per 37 C.F.R. §1.121, the current status of all the claims in the present application is presented below, amended claims are noted to indicated changes made and the text of pending claims not being amended are presented clean. Amendments to the following are indicated by underlining what has been added and striking-through what has been deleted.

This listing of the claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (original) A fusion protein comprising a first polypeptide of at least 90% identity to a sequence of amino acid residues as shown in SEQ ID NO:2 and comprising a second cytokine polypeptide or fragment thereof, wherein the fusion protein binds a receptor as shown in SEQ ID NO:115.

2. (Currently amended) The fusion protein of claim 1, wherein the second polypeptide is selected from the group consisting of IL-2 as shown in SEQ ID NO:111, ~~IL-4 as shown in SEQ ID NO:112, IL-15 as shown in SEQ ID NO:113, and GM-CSF as shown in SEQ ID NO:114~~.

3. (withdrawn) A fusion protein comprising at least four polypeptides, wherein the order of polypeptides from N-terminus to C-terminus are:

a first polypeptide that comprises a sequence of amino acid residues from 41 to 56 of SEQ ID NO: 2;

a first spacer of 6-27 amino acid residues;

a second polypeptide that comprises a sequence of amino acid residues selected from the group consisting of:

- (a) IL-2 helix B residues 53-75 of SEQ ID NO: 111;
- (b) IL-4 helix B residues 65-83 of SEQ ID NO: 112;
- (c) IL-15 helix B residues 84-101 of SEQ ID NO: 113;
- (d) GMCSF helix B residues 72-81 of SEQ ID NO: 114; and
- (e) amino acid residues 69-84 of SEQ ID NO: 2;

a second spacer of 5-11 amino acid residues;

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a third polypeptide that comprises a sequence of amino acid residues selected from the group consisting of:

- (a) IL-2 helix C residues 87-99 of SEQ ID NO: 111;
- (b) IL-4 helix C residues 95-118 of SEQ ID NO: 112;
- (c) IL-15 helix C residues 107-119 of SEQ ID NO: 113;
- (d) GMCSF helix C residues 91-102 of SEQ ID NO: 114; and
- (e) amino acid residues 92-105 of SEQ ID NO: 2;

a third spacer of 3-29 amino acid residues; and

a fourth polypeptide that comprises a sequence of amino acid residues selected from the group consisting of:

- (a) IL-2 helix D residues 103-121 of SEQ ID NO: 111;
- (b) IL-15 helix D residues 134-157 of SEQ ID NO: 112;
- (c) IL-4 helix D residues 134-160 of SEQ ID NO: 113;
- (d) GMCSF helix D residues 120-131 of SEQ ID NO: 114; and
- (e) amino acid residues 135-148 of SEQ ID NO: 2.

4. (withdrawn) A fusion protein comprising at least four polypeptides, wherein the order of polypeptides from N-terminus to C-terminus are:

a first polypeptide that comprises a sequence of amino acid residues selected from a group consisting of:

- (a) IL-2 helix A residues 36-46 of SEQ ID NO: 111;
- (b) IL-4 helix A residues 29-43 of SEQ ID NO: 112;
- (c) IL-15 helix A residues 45-68 of SEQ ID NO: 113;
- (d) GMCSF helix A residues 30-44 of SEQ ID NO: 114; and
- (e) amino acids residues 41-56 of SEQ ID NO: 2;

a first spacer of 6-27 amino acid residues;

a second polypeptide that comprises a sequence of amino acid residues selected from the group consisting of:

- (a) IL-2 helix B residues 53-75 of SEQ ID NO: 111;
- (b); IL-4 helix B residues 65-83 of SEQ ID NO: 112;
- (c) IL-15 helix B residues 84-101 of SEQ ID NO: 113;
- (d) GMCSF helix B residues 72-81 of SEQ ID NO: 114; and
- (e) amino acid residues 69-84 of SEQ ID NO: 2;

a second spacer of 5-11 amino acid residues;

a third polypeptide that comprises a sequence of amino acid residues selected from the group consisting of:

Applicants: Novak et al.

Serial No.: 10/787,442

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(a) IL-2 helix C residues 87-99 of SEQ ID NO: 111;  
(b) IL-4 helix C residues 95-118 of SEQ ID NO: 112;  
(c) IL-15 helix C residues 107-119 of SEQ ID NO: 113;  
(d) GMCSF helix C residues 91-102 of SEQ ID NO: 114; and  
(e) amino acid residues 92-105 of SEQ ID NO: 2;  
a third spacer of 3-29 amino acid residues; and  
a fourth polypeptide that comprises a sequence of amino acid residues from 135-148 of SEQ ID NO: 2.

5. (withdrawn) A fusion protein according to claim 3, wherein the fourth polypeptide comprises amino acid residues 135-148 of SEQ ID NO: 2.

6. (withdrawn) A fusion protein comprising a polypeptide with at least 90% identity to a sequence of amino acid residues as shown in SEQ ID NO:2 from amino acid residues 32-162 and immunoglobulin heavy chain constant region, wherein the fusion protein bind a receptor as shown in SEQ ID NO:115.

7. (withdrawn) The fusion protein of claim 6, wherein the polypeptide has at least 95% identity to a sequence of amino acid residues as shown in SEQ ID NO:2 from amino acid residues 32-162.

8. (withdrawn) A fusion protein comprising a polypeptide as shown in SEQ ID NO:2 from amino acid residues 32-162 and immunoglobulin heavy chain constant region.

9. (withdrawn) A fusion protein comprising a polypeptide as shown in SEQ ID NO:2 from amino acid residues 32-162 and immunoglobulin heavy chain constant region, wherein the immunoglobulin heavy chain is an Fc fragment.

10. (Currently amended) The fusion protein of claim 1, wherein the first polypeptide of at least 95% identity to a sequence of amino acid residues as shown in SEQ ID NO:2,

11. (Currently amended) The fusion protein of claim 1, wherein the first polypeptide is the sequence of amino acid residues as shown in SEQ ID NO:2 and wherein the second polypeptide is IL-2 as shown in SEQ ID NO:111.

Applicants: Novak et al.

Serial No.: 10/787,442

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12. (previously presented) The fusion protein of claim 1, wherein the first polypeptide is a sequence of amino acid residues as shown in SEQ ID NO: 2 from residue 32 to residue 162.